June 9, 2017

BY ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services, et al.*, GN Docket No. 14-177, IB Docket No. 15-256, WT Docket No. 10-112, and IB Docket No. 97-95

Dear Ms. Dortch:

The Boeing Company, EchoStar Satellite Operating Corporation, Hughes Network Systems, LLC, Intelsat Corporation, Inmarsat, Inc., O3b Limited, SES Americom, Inc., and WorldVu Satellites Ltd. d/b/a OneWeb (collectively, the "Satellite Broadband Companies") hereby provide additional evidence demonstrating the minimal impact their revised population coverage approach will have on Upper Microwave Flexible Use Service ("UMFUS") licensees operating in the 27.5-28.35 ("28") GHz, 37.6-38.6 ("37") GHz and 38.6-40 ("39") GHz bands.

In a Joint Reply to Petitions for Reconsideration in the above referenced proceeding ("Spectrum Frontiers Proceeding"), the Satellite Broadband Companies proposed several revisions to the earth station siting restrictions established in Section 25.136 of the Commission's rules.[1] Among these proposals, the Companies recommended a tiered approach in lieu of the Commission's requirement that an earth station may not cover more than 0.1 percent of the population in either a 28 GHz county or 37/39 GHz Partial Economic Area ("PEA"). The tiered approach was designed to increase earth station siting options without significantly increasing the burden on UMFUS licensees, which would better serve the Commission's intent to "adopt rules that will allow both satellite and terrestrial networks to continue to expand in a flexible manner."[2]

Several terrestrial interests have challenged the potential effect the tiered approach will have on future UMFUS operations and have suggested it would represent a "significant expansion" in satellite rights in the bands[3] or even "preclude terrestrial mobile services,"[4] which

[1] *See generally* Joint Reply to Oppositions, GN Docket No. 14-177, *et al.* (Feb. 24, 2017).
[2] *See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, 31 FCC Rcd. 8014, ¶ 18 (2016) ("*Spectrum Frontiers Order*").
[3] Letter from Davidi Jonas, President and CEO of Straight Path, to Marlene H. Dortch, GN Docket No. 14-177, *et al.*, 2 (filed May 26, 2017).
[4] Letter from Scott K. Bergmann (CTIA) to Marlene H. Dortch, GN Docket No. 14-177, *et al.*, at 6 (May 22, 2017).

simply is not the case. The Satellite Broadband Companies have prepared the attached maps comparing the area affected by a representative earth station under the population limit authorized in Section 25.136 to the area affected under the population limit proposed in the Satellite Broadband Companies' tiered approach.[5]

As previously described, the Satellite Broadband Companies have proposed the following tiers and related population coverage thresholds for both the 28 GHz and the 37/39 GHz bands.

The proposal for earth station siting in the 28 GHz band is summarized below.

Tier 1 - High population county	Population greater than 300,000	FSS earth stations may cover no more than 0.2% of the license area's population.
Tier 2 – Low to medium population county	Population between 6,000 and 300,000	FSS earth stations may cover a total of 600 people without reference to the license area's population.
Tier 3 – Very low population county	Population less than 6,000	FSS earth stations may cover 10% of the license area's population.

The proposal for earth station siting in the 37/39 GHz band is summarized below.

Tier 1 - High population PEA	Population greater than 1,500,000	FSS earth stations may cover no more than 0.2% of the license area's population.
Tier 2 – Low to medium population PEA	Population between 60,000 and 1,500,000	FSS earth stations may cover a total of 3000 people without reference to the license area's population.
Tier 3 – Very low population PEA	Population less than 60,000	FSS earth stations may cover 5% of the license area's population.

Attachment 1 depicts the coverage area for an earth station operating in the 28 GHz band in San Diego County under the current 0.1 percent population coverage limit (blue dot). The location is similar to the location of an existing EchoStar location to ensure access to appropriate

[5] The locations shown in the maps do not take into account the transient population restrictions, which could prohibit actual FSS earth station siting at these locations.

teleport facilities, which would include buildings and fiber access. Under the FCC's current rule, the earth station could cover no more than 3095 people in a county consisting of 3,095,313 people. As demonstrated in Attachment 1, this equates to a radial coverage area of approximately one kilometer around the chosen site. Under the proposed tiered approach, the earth station coverage threshold would increase to 6190 people and the radial geographic coverage would increase by 200 meters (white circle). The overall area in which UMFUS operators could experience interference from a satellite earth station is miniscule, and the addition of 0.1 percent of the population is barely perceptible, let alone a significant expansion of earth station rights in the band. The proposed increase to 0.2 percent ensures that the UMFUS licensee continues to have unfettered access to 99.8 percent of the population (3,089,123 people for San Diego County) in a license area and virtually all of the geographic area.

Attachment 2 depicts the available coverage area for a 28 GHz earth station operating in a Tier 2 county. As in Tier 1, the Companies have identified a location that is similar to an existing earth station because it is representative of a location likely to be chosen for a gateway. Specifically, the location is similar to SES's Woodbine, MD earth station facility, which has access to sufficient fiber and other necessary inputs. In this county of 167,134 people, an earth station could cover up to 167 people under the current rules. The area that meets this requirement is bounded by the light blue line in Attachment 2, which equates to a radial geographic coverage area of approximately one kilometer. When the tiered approach is applied, the available earth station population coverage increases to 600, or an additional 433 people, and the radial geographic coverage area increases by 1.5 kilometers (white line). As in Tier 1, the potential increase in area in which an UMFUS licensee could experience interference is small relative to the size of the county – and still leaves 166,534 out of 167,134 people in the county totally unencumbered by satellite operations and available for UMFUS service. While the potential impact as demonstrated in Attachment 2 is small, the benefit to earth station operations is significant as the proposed increased coverage flexibility would expand siting options for earth station operators. At a minimum the additional coverage would ensure that at least one earth station could be located in the county[6] and would potentially allow for a competing earth station to be located in the county.

Attachment 3 depicts the available coverage area for a 28 GHz earth station operating in a Tier 3 county. Tier 3 counties pose a unique challenge because, while they may have significant geographic area in which there is no population, those areas typically do not include the physical facilities needed to support a gateway, such as buildings, fiber connections, road access and a technically skilled employee pool. In Attachment 3, the Companies have identified a location within Stark County, Illinois that would most likely possess the required physical facilities. The county consists of 5,994 people; therefore under the current rule, a 28 GHz earth station could only cover 5.9 people, which limits the siting options to areas without access to fiber and other necessary inputs. Under the proposed tiered approach, the earth station could cover up to 599 people which would result in a radial geographic coverage area of approximately 1 kilometer (red circle). As with Tier 2, the additional coverage could be used to allow one or

[6] *See* Petition for Reconsideration of SES Americom, Inc. and O3b Limited, GN Docket No. 14-177, *et al.* 7-8 (Dec. 14, 2016).

multiple competing earth station operators to site earth stations in a county that is not a high value target for high density UMFUS deployment. Furthermore, the access earth stations would gain in this and other Tier 3 counties would not greatly impact future UMFUS operations. The Commission and the wireless industry have recognized that UMFUS operators will use spectrum above 24 GHz primarily to provide services in denser population centers in order to relieve capacity constraints in high-traffic areas.[7] Indeed, several commenters have stated that rural UMFUS operators will not be able to meet the Commission's build out requirements of 40 percent of the service area population.[8] The addition of earth station operations in these counties will ensure the spectrum is put to effective use.

Finally, it is critical to note that before deploying an earth station within the area in which an UMFUS licensee could experience interference, the satellite operator will have to demonstrate that it has successfully completed frequency coordination with the UMFUS licensee with respect to existing facilities constructed and in operation.

Despite the dire predictions of several terrestrial operators, the tiered approach advocated by the Satellite Broadband Companies will not have a significant impact on the ability of UMFUS licensees to develop their licenses and implement their business plans. The proposal would, however, give earth station operators greater ability to "expand in a flexible manner" and provide the broadband services U.S. consumers demand across the country, including in rural and remote locations – areas that UMFUS operators are unlikely to serve

Respectfully submitted,

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[7] *See Spectrum Frontiers Order* ¶ 35; Letter from Scott K. Bergmann (CTIA) to Marlene H. Dortch, GN Docket No. 14-177, *et al.*, at 2 (May 20, 2016).

[8] Petition for Reconsideration of Competitive Carriers Association, GN Docket No. 14-177, *et al.*, at 9-11 (Dec. 14, 2016) ("many rural carriers serve unpopulated areas, and therefore installing points of presence ('POPs') or links as described in the *Report and Order* would be a wasted expense. However, this does not . . . justify the loss by a rural carrier of an 'empty' county within its licensed BTA" (citations omitted)); *see also* Petition for Reconsideration of The Rural LMDS Licensees, GN Docket No. 14-177, *et al.*, at 4-6 (Dec. 14, 2016).

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Attachments

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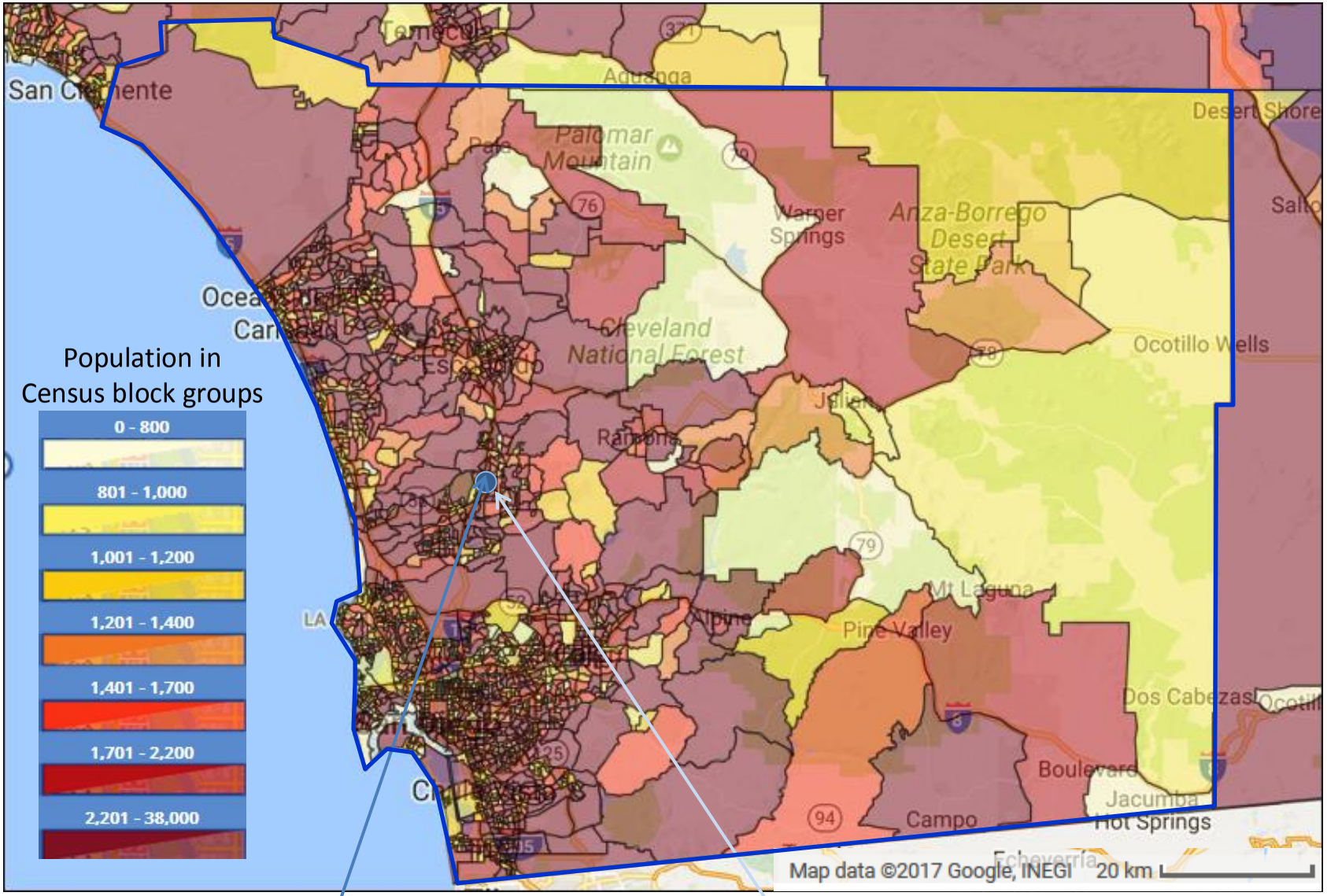
Attachment 1

San Diego county, CA 3,095,313 people

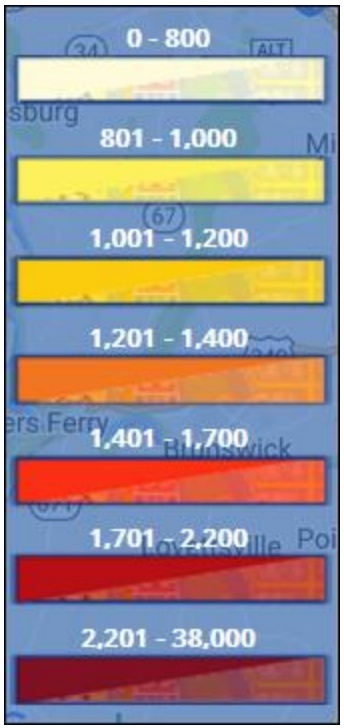


3095 people impacted (0.1%)
3,092,218 people not impacted

6190 people impacted (0.2%)
3,089,123 people not impacted

Attachment 2

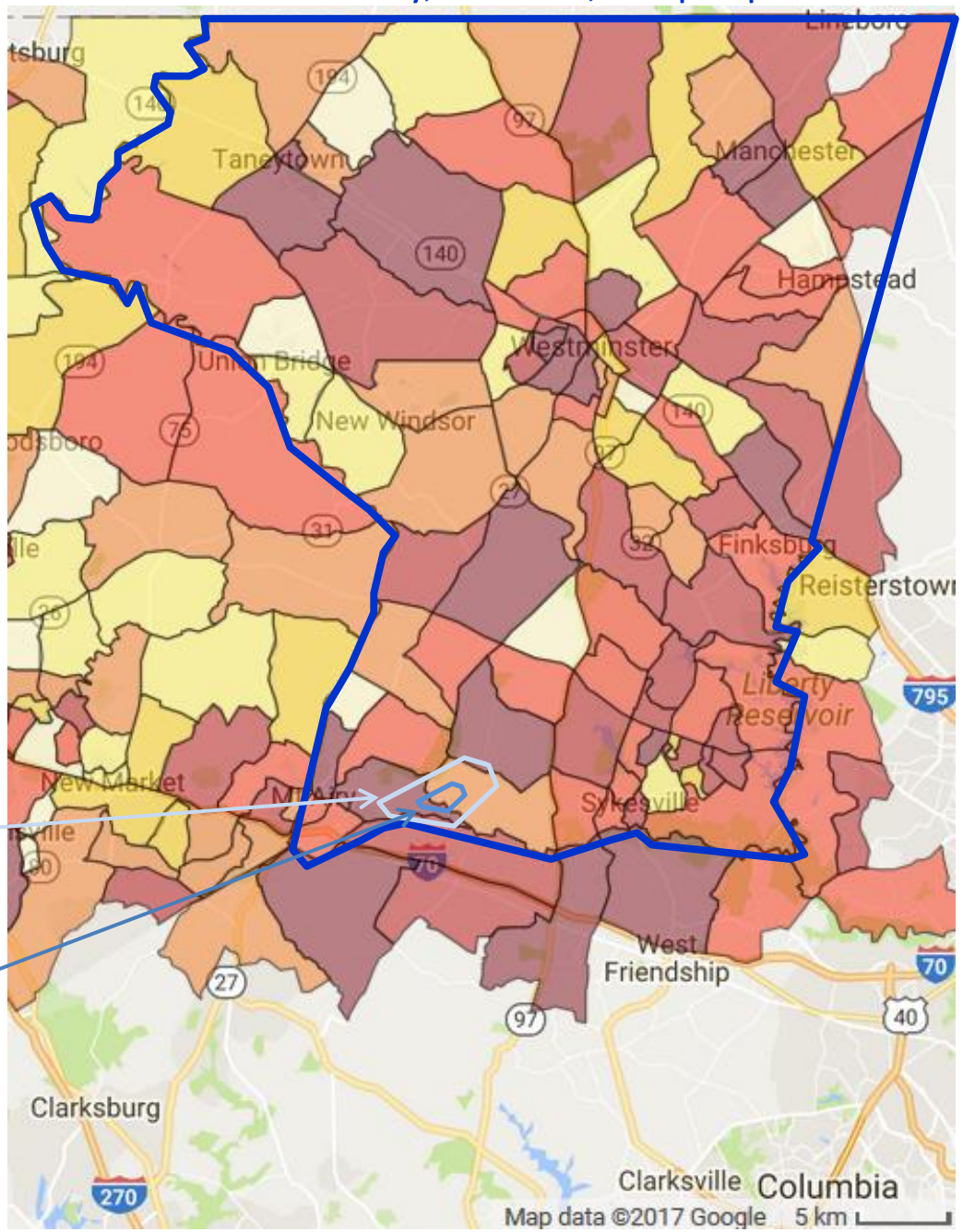
Population in
Census block groups



600 people impacted (0.36%)
166,534 people not impacted

167 people impacted (0.1%)
166,967 people not impacted

Carroll county, MD 167,134 people



Attachment 3

Stark county, IL
5,994 people